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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/821,606	04/08/2004	Sang H. Dhong	END920030125US1 (17131)	1561
23389 7590 09/28/2009 SCULLY SCOTT MURPHY & PRESSER, PC 400 GARDEN CITY PLAZA SUITE 300 GARDEN CITY, NY 11530				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/821,606

**Applicant(s)**

DHONG ET AL.

**Examiner**

Chat C. Do

**Art Unit**

2193

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 08 June 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1, 6-8, 10-13 and 18-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 10 is/are allowed.
- 6) ☒ Claim(s) 6-8, 11-13 and 18-23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04/08/2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

1. This communication is responsive to Amendment filed 06/08/2009.
2. Claims 1, 6-8, 10-13 and 18-23 are pending in this application. Claims 1, 10 and 13 are independent claims. In Amendment, claims 2-5, 9 and 14-17 are cancelled and claims 22-23 are added. This Office Action is made final.

### ***Drawings***

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the newly added limitations “a shift calculator for determining....to generate a shifted operand” in claims 1 and 13 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet”

pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

*Claim Rejections - 35 USC § 112*

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 1, 6-8, 11-13 and 18-23 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Re claims 1 and 13, the newly added limitations “a shift calculator for determining....to generate a shifted operand” in pages 3 and 6 are not originally described in the specification in such a way as to enable one skilled in the art to which it pertains in order to make and/or use the invention.

Thus, claims 6-8, 11-12 and 18-23 are also rejected for being dependent on the rejected based claims 1 and 13 respectively.

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 1, 6-8, 11-12 and 21-23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Re claim 1, the limitation "a second unit for ...using said shift component and an exponent and an exponent of the selected one of the operands" is unclear whether it is a typo or the second unit is computed from three different parameters as shift component, an exponent and another exponent of the selected one of the operands. For examination purposes, the examiner considers the second unit for calculating the shift amount using the result of shift component, and an exponent of the selected one of the operands (similar to claim 13).

Re claim 22, the limitation "multiplier" in line 2 is indefinite since the standard definition of multiplier is for multiplication instead of for selecting the exponent and sending the exponent. For examination purposes, the examiner considers the multiplier as multiplexer.

Thus, claims 6-8, 11-12, 21 and 23 are also rejected for being dependent on the rejected based claims 1 and 22 respectively.

### ***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1, 11-13 and 21-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Elliott et al. (U.S. 5,880,983) in view of Ho et al. (U.S. 7,346,643).

Re claim 1, Elliott et al. disclose in Figures 2 a floating point execution unit (e.g. Figure 2) for performing multiply/add operations (e.g. abstract and col. 3 lines 39-46) on a floating point number comprising a plurality of operands taken from an instruction having a plurality of operand positions (e.g. corresponding to A, B, and C operands as mentioned in col. 1 lines 21-50), the floating point unit comprising: a multiplier (e.g. component 102 in Figure 2B) for calculating a product of two of the operands (e.g. as output of multiplier 102 with C and A as input operands in Figure 2B); a first data path for supplying to the multiplier a first and second of the operands from the instruction, wherein the multiplier multiplies said first and second operands to produce a product (e.g. multiplier 102 in Figure 2B for multiplying C and A as first and second operands respectively); an aligner (e.g. components first and second aligners 118 in Figures 2A and 2B); a second data path for supplying one of the operands from the instruction to the aligner (e.g. data path for feeding either A or B into muxes 114 as second and third operands respectively in Figure 2A); a multiplexer (e.g. muxes 114 and 116 in Figure 2A) on the second data path for receiving the second operand and third of the operands from the instruction, for selecting one of said second and third operands, and sending said selected one of the operands to the aligner (e.g. by the mux 114 in Figure 2A for receiving and selecting either A and B as second and third operands respectively and send the result of mux to the component 118); a shift calculator for determining a shift amount for said selected one of the operands (e.g. by the components 111 and 112 in Figure 2A)

wherein said aligner shifts the selected one of the operands by said shift amount to generate a shifted operand (e.g. by the alignment 118 in Figure 2A); and an adder for adding the product formed by the multiplier and the shifted operand to produce a result (e.g. by the adder 120 in Figure 2A); and wherein the first data path is maintained free of multiplexer operations (e.g. supplying A and C to the multiplier 102 in Figure 2B).

Elliott et al. fail to disclose the shift calculator is including a first unit for calculating a shift component using exponents of the first and second operands, and a second unit for calculating said shift amount using said shift component and an exponent and an exponent of the selected one of the operands. However, Ho et al. disclose in Figure 2 the shift calculator (e.g. by components 220, 226 and 252 in Figure 2) is including a first unit for calculating a shift component using exponents of the first and second operands (e.g. by component 220 wherein S and T as first and second operands in Figure 2), and a second unit for calculating said shift amount using said shift component and an exponent and an exponent of the selected one of the operands (e.g. by components 226 and 252 wherein output of component 220 as the shift component amount; and T and R are the second and third operands respectively in Figure 2).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention is made to add the shift calculator is including a first unit for calculating a shift component using exponents of the first and second operands, and a second unit for calculating said shift amount using said shift component and an exponent and an exponent of the selected one of the operands as seen in Ho et al.'s invention into

Elliott et al.'s invention because it would enable to improve the system performance and accuracy (e.g. col. 2 lines 48-58).

Re claim 11, Elliott et al. further disclose in Figures 2 the means to compute the shift amount compresses two of the three input exponents and an offset while selecting the third exponent (e.g. two of three inputs exponents are belong to addends as seen in Figure 2A).

Re claim 12, Elliott et al. further disclose in Figures 2 when executing an add or subtract instruction, the means to compute the shift amount computes the alignment shift amount as  $ea+eb-2eb$  (e.g. Figure 2A as difference between the adding operand in order to align properly).

Re claim 13, it is a method claim having similar limitations cited in claim 1. Thus, claim 13 is also rejected under the same rationale as cited in the rejection of rejected claim 1.

Re claim 21, Elliott et al. further disclose in Figures 2 the operand muxing occurs in the aligner and the operand muxing in the aligner is merged with a shift-amount calculation (e.g. Figure 2A in primary reference and Figure 4 in secondary reference).

Re claims 22-23, Elliott et al. fail to disclose the shift calculator further includes a multiplier for receiving exponents of the second and third operands, and for selecting the exponent of one of said second and third operands, and sending the selected exponent to said second unit and wherein the multiplier of the shift calculator performs the selecting of the exponent of one of said second and third operands while the first unit of the shift calculator calculates the shift component. However, Ho et al. disclose in Figure 2 the



shift calculator (e.g. by components 220, 226 and 252 in Figure 2) further includes a multiplier for receiving exponents of the second and third operands, and for selecting the exponent of one of said second and third operands, and sending the selected exponent to said second unit (e.g. by component 220 in Figure 2) and wherein the multiplier of the shift calculator performs the selecting of the exponent of one of said second and third operands (e.g. by the component 226 in Figure 2) while the first unit of the shift calculator calculates the shift component (e.g. Figure 2).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention is made to add the shift calculator further includes a multiplier for receiving exponents of the second and third operands, and for selecting the exponent of one of said second and third operands, and sending the selected exponent to said second unit and wherein the multiplier of the shift calculator performs the selecting of the exponent of one of said second and third operands while the first unit of the shift calculator calculates the shift component as seen in Ho et al.'s invention into Elliott et al.'s invention because it would enable to improve the system performance and accuracy (e.g. col. 2 lines 48-58).

10. Claims 6-8 and 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Elliott et al. (U.S. 5,880,983) in view of Ho et al. (U.S. 7,346,643), as applied to claims 1 and 13, and in further view of Willson Jr. et al. (U.S. 7,228,325).

Re claims 6-8, Elliott et al. in view of Ho et al. fail to disclose in Figures 2 each of the operands has an exponent value, and floating point execution unit determines whether

the exponent values of any of the operands is zero in parallel with operation of the multiplier and the aligner; floating point execution unit tests the exponent values for a zero value while the multiplier calculates the product; the floating point execution unit establishes a test result number based on results of the determination.

However, Willson Jr. et al. disclose each of the operands has an exponent value, and floating point execution unit determines whether the exponent values of any of the operands is zero in parallel with operation of the multiplier and the aligner (e.g. col. 7 line 60 to col. 8 line 15); floating point execution unit tests the exponent values for a zero value while the multiplier calculates the product; the floating point execution unit establishes a test result number based on results of the determination (e.g. as for bypass the adder and claims 30-31).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention is made to add each of the operands has an exponent value, and floating point execution unit determines whether the exponent values of any of the operands is zero in parallel with operation of the multiplier and the aligner; floating point execution unit tests the exponent values for a zero value while the multiplier calculates the product; the floating point execution unit establishes a test result number based on results of the determination as generally seen in concept in willson Jr. et al.'s invention into Elliott et al. in view of Ho et al.'s invention because it would lower power consumption (e.g. col. 7 lines 50-65 due to bypassing the adder/multiplication computation).

Re claim 18, it is a method claim having similar limitations cited in claim 6. Thus, claim 18 is also rejected under the same rationale as cited in the rejection of rejected claim 6.

Re claim 19, it is a method claim having similar limitations cited in claim 7. Thus, claim 19 is also rejected under the same rationale as cited in the rejection of rejected claim 7.

***Allowable Subject Matter***

11. Claim 10 is allowed.

***Response to Amendment***

12. The amendment filed 06/08/2009 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows:

The newly added limitations in claims 1 and 13 “a shift calculator for determining...to generate a shifted operand” are considered as new matter introduced into the original disclosure since the original disclosure does not fully or clearly address the specific structure of the shift calculator.

Applicant is required to cancel or clearly point-out the support of the new matter in the reply to this Office Action.

***Response to Arguments***

13. Applicant's arguments with respect to claims 1, 6-8, 11-13 and 18-23 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHAT C. DO whose telephone number is (571)272-3721. The examiner can normally be reached on Tue-Fri 9:00AM to 7:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lewis Bullock can be reached on (571) 272-3759. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Chat C. Do/  
Primary Examiner, Art Unit 2193

September 24, 2009